NEW WESTERN PLANTS. I.

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AGROPYRON SPICATUM **pubescens**, n. var.—A tufted subalpine perennial. Culms slender, 4 dm high, cinereous pubescent below the joints. Blades mostly involute, soft pubescent on both sides, pointed, averaging 1 dm in length, divaricately disposed; sheaths pubescent, shorter than the internodes; ligule very short. Spike 7–10 cm long, glabrous or sometimes glaucous; spikelet flattened, 5–7-flowered; glumes abruptly terminated by setaceous points, lower 8 mm long, 3-nerved, upper 9 mm long, usually 5-nerved; lower palet 5-nerved toward the apex, bearing a slender divergent awn; upper palet equal in length, slightly scabrous on the nerves above the middle, emarginate; stamens 3, anthers 3 mm long.

This variety (number 1158) was collected by the writer at an altitude of 1000 m on Mt. Stuart, Kittitas county, Washington, in July, 1898. Type specimen is in the herbarium of Stanford University.

Festuca arida, n. sp.— A loosely tufted fibrous rooted annual, turning purplish at maturity. Culms varying from 3-13 cm in length, geniculate at the lower joints, striate, nearly glabrous. Leaves 1-5 cm long, involute, smooth outside, canescent inside; sheaths exceeding lower internodes, margins overlapping, smooth, the upper one inflated and partially inclosing the young inflorescence; ligule very minute, brownish. Panicle at maturity exserted, divaricately branched; rays usually single, ridged, puberulent; spikelets few, secund, sessile, 6 mm long, 2-3flowered from near the base; glumes entirely smooth, unequal by 1 mm, lower sharply acuminate and 1-nerved, upper 3-nerved, 6 mm long; lower palet 5-nerved, nearly 6 mm long, ciliate with long and dense hairs over the entire back, bearing an awn 5 mm long; upper palet of equal length, rather broad from the middle toward the base, acuminate toward the apex, hyaline except the two nerves which terminate in fine bristle-like points; anthers

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very short; seeds 4 mm long, brown, lanceolate, grooved on one side.

In habit this plant resembles F. microstachya Nutt. from which it is separated by its dense evenly ciliate lower palet, and from F. microstachya ciliata Gray by its glabrous glumes. This species (number 2196) was collected by Professor L. F. Henderson at North Yakima, Yakima county, Washington, May, 1892. Type specimen is in my herbarium.

Festuca idahoensis, n. sp.— Apparently a perennial, from creeping rootstocks. Culms striate, shining, 7–9 dm high, 2–3-jointed. Cauline leaves few, filiform, those of the sterile shoots equaling or exceeding the culms, striate, glabrous beneath, involute, less than 0.5 mm in diameter, canescent inside; sheaths loose, striate, smooth, the throat abruptly constricted at the leaf base; ligule a brown narrow fimbriate band. Panicle ovate, 7–12 cm long; rays 2, spikelet-bearing from below the middle; spikelets few, loosely 3–4-flowered, 10 mm or less long; glumes glabrous, broad, 3-nerved, upper 4 mm long and obtuse, lower acute, 3 mm long; lower palet broadly lanceolate, obscurely 5-nerved, 6 mm long, bearing a scabrous awn 3 mm long; upper palet equal in length, quite broad, 2-nerved, slightly bidentate at the apex; each of the 3 anthers 3 mm long; styles 2, distinct, upon the obovoid ovary.

This fescue grass is distinguished from F. rubra L., which it resembles, by its extremely long filiform leaves. It was collected by Mr. L. R. Abrams, in Smith's Valley, Shoshone county, Idaho, July, 1900. Type specimen (number 688) is in Mr. Abrams' herbarium.

Bromus magnificus, n. sp.—A scattering perennial, with creeping rootstocks, bearing few slender woolly fibrous roots. Culms 1-3 m tall, shining, erect, with 6-9 densely pubescent joints. Blades flat, scabrous on the edges, 7 mm wide, the larger ones 3 dm long, upper surface puberulent with few bristle-like hairs, lower surface glabrous, apex acuminate; sheaths soft, equaling the internodes, conspicuously striate, entirely covered with long soft retrorse hairs; ligule brownish, 2 mm long. Panicle not drooping, pyramidal in outline, 25 cm long, nearly the same in diameter at the base; rays 2-3, long and slender, subtended by a circle of fine hairs, pendulously flexuose, 1-2-branched from the middle, scabrous near the distal ends; spikelets soft,

2-3 cm long, flattened, attenuate toward the base, 7-9-flowered; glumes unequal by 1 mm, upper one 8 mm long and 3-nerved, lower 1-nerved, pubescent, both acuminate with a point 1 mm long; rachilla pubescent; lower palet pubescent around the base and on the sides below the middle, the upper half becoming scabrous, 12 mm long, prominently 3-nerved and often with minor ones between, bearing a straight scabrous awn 5 mm long; upper palet shorter by 3 mm, long-ciliate on its 2 nerves; stamens 3, their anthers nearly 3 mm long; styles 2, from below the bristle covered callous cap.

This magnificent Bromus was found by the writer only in a small shaded boggy district near Port Angeles, Clallam county, Washington, August, 1900. I have the identical species duplicated in a specimen from Yes Bay, Alaska, collected by Mr. T. Howell, in 1885, number 1722A. Professor C. L. Shear in his revision of the genus refers Howell's specimen to B. sitchensis Bong., from which it is at once separated by its pilose nodes, sheaths, and spikelets. It is most nearly related to B. pacificus Shear, from which it differs in its much larger size, the smooth lower surface of its leaves, the lax panicle whose rays are not secund, the slender-pointed glumes, and much shorter upper palet. Type specimen (number 1957) is in the herbarium of Stanford University.

Panicularia multifolia, n. sp.—A weak subaquatic perennial, with slender creeping rootstocks bearing fibrous roots at the nodes. Culms generally reclining, 9-12-jointed, rather soft in texture, 7-9dm long. Blades all cauline, as many as there are joints, flat, glabrous on both sides, finely scabrous along the margins, the largest ones 14cm long and 10mm wide, gradually diminishing in size, all acuminately lanceolate; sheaths glabrous, the upper ones exceeding the internodes; ligule 3 mm long, hyaline, becoming lacerate. Panicle ovate, 5-8cm long by 3cm wide at the base, strict; rays 2, rigidly flexuose, smooth or slightly scabrous, with 3-5 spikelets, branched from below the middle; spikelets not compressed, 3-5-flowered, falling extremely early, the largest ones 5 mm long; marginal apex of the persisting glumes hyaline, subequal, lower 1 mm long, upper broadly spoon-shaped; lower palet conspicuously 5-nerved, obscurely scabrous on the margin and the nerves, 3 mm long, broadly elliptical, the hyaline apex subtended by a narrow brown band; upper palet a trifle

shorter, scabrous on the two nerves, notched at the apex, sides hyaline; anthers a little longer than 0.5 mm; styles 2, separate, inserted on the glabrous ovary.

This Panicularia was discovered in a subalpine open boggy place in the woods of the Olympic mountains (elevation 1,000^m), Clallam county, Washington, August, 1900. It is at once distinguished from *P. pauciflora* (Presl.) Kuntz, by its slender many jointed leafy stem, the uniformly small rigid panicle, and the very early falling of the flowers, leaving the glumes still attached. Of this rare species the type specimen (number 1939) is in the herbarium of Stanford University.

Panicularia flaccida, n. sp.—A tall perennial, from slender creeping rootstocks. Culm 1-2m high, smooth and shining, 5-7-jointed, rather soft and reclining. Blades as many as there are joints, flat, finely scabrous on both sides, flaccid, 12-15 mm wide, averaging 2cm long, lanceolate acuminate, with a strong midnerve from the base; sheaths a trifle shorter than the internodes, glabrous, many striate; ligule membranous, hyaline, 2-3 mm long, ultimately becoming lacerate. Panicle lax, subpendulous, 15-20 cm long, 9-15 cm in diameter; rays 2, 3, or 5, usually branched from or below the middle, slender, lax and flexuose, slightly scabrous on the ultimate branches; spikelet 3-5 mm long, compressed, 5-7-flowered, soft in texture; glumes persistent after the breaking up of the flowers, the upper half hyaline or in age entirely so, nerveless, glabrous, the lower 1 mm long and obtusish, the upper a trifle longer and ladle-shaped; rachilla 5 mm long, terminating in a rudimentary flower; lower palet broadly elliptical, finely scabrous on the conspicuous 5 nerves, 2.5 mm long, the upper margin hyaline; upper palet 2 mm long, rather broad, obscurely scabrous on the 2 nerves above the middle, apex with a shallow notch; stamens 3, with anthers 0.5 mm or a trifle longer; styles 2, distinct.

This grass is separated from *P. pauciflora* (Presl) Ktz. by its taller, more flaccid habit, pale color, and the larger lax panicle. It was collected by myself in a shaded boggy place in the foothills of the Olympic mountains, Clallam county, Washington, July, 1900. Type specimen (number 1940) is in the herbarium of Stanford University.

Poa laeviculmis Williams, n. sp.—A robust, densely tufted,

¹In a recent communication from Professor W. J. Spillman, Agrostologist of the Bureau of Plant Industry, U. S. Department of Agriculture, concerning this grass, I

glabrous, glaucous perennial, 7-10 dm high, with linear, plane, or mostly involute leaves, and exserted rather densely flowered panicles 1.5-2 dm long. Culms glabrous throughout; sheaths glabrous, shorter than the internodes; ligule firm, truncate, 1-2 mm long; leaf blades rather firm, usually involute, at least when dry, scabrous only on the margins, those of the culm 1-2 dm long, 3-4 mm wide, those of the innovations often 3 dm in length. Panicle lanceolate, 1.5-3 cm in diameter, pale or purplish, rachis nearly glabrous, branches erect or ascending, fasciculate, rather densely flowered, scabrous, the lower ones 5-7cm long. Spikelets lanceolate, 6-10 mm long, 4-6-flowered; empty glumes lanceolate, acuminate, 3-nerved, scabrous on the keels, the first 3.5-4 mm long, the second somewhat longer; flowering glumes lanceolate, acute, about 5 mm long, faintly 5-nerved, minutely punctate scabrous throughout, basal hairs entirely wanting. Palea about equaling the glumes, ciliate scabrous on the keels.

Type specimen collected at Steptoe, Washington, G. R. Vasey, number 3026, June 25, 1900. Numbers 3034 and 3028, G. R. Vasey, June 1, from the same locality, are referred here, as well as number 2421A, W. C. Cusick, Wallowa county, Oregon, June, 1900. Number 3028 Vasey cited above is a very glaucous form with plane leaves, but otherwise like the type. It is closely related to Poa nevadensis, but is distinguished by its more robust habit, and glabrous leaves and culms. In Poa nevadensis the culms are decidedly scabrous below the panicles and the leaves are very scabrous. From Poa ampla this species is distinguished by its more strict panicles, more numerously flowered spikelets, and absence of a rootstock.

Puccinellia rubida, n. sp.—A densely tufted biennial, from numerous fibrous roots. Culms few, erect or geniculate below, slender, 2-3 dm long, smooth, naked from the middle, usually of a dark red color. Leaves very numerous from the base, 3-7 dm long, mostly falcate, strongly involute, smooth and glaucous on the outside, scabrous along the edges, rigid and pungently pointed, cauline ones 2 or 3, very short; sheaths longer than the internodes, smooth, glaucous green to purplish; ligule 1 mm long,

received a copy of Mr. T. A. Williams' diagnosis of this species. Professor Spillman kindly suggested that I include it for publication in this article, with an explanation that it has been in manuscript for some two years and would have been published sooner had it not been for Mr. Williams' death.

entire, obtuse, decurrent on the margins of the sheaths. Purplish panicle ovate, 3-7cm long; rays 2-4, unequal in length, ascending, scabrous toward their distal ends, branched beyond the middle; spikelets usually 3-5-flowered, 5 mm long, narrowly lanceolate to linear, upon thickened purplish pedicels; glumes obscurely nerved, glabrous, purplish, lower broadly obovate and a trifle longer than 1mm, upper 2.5mm long, 3-nerved at the base; lower palet obscurely 3-5-nerved, of the same purple color except the brown hyaline tip, obtuse, averaging 3 mm long, broadly elliptical; upper palet at least equal in length, bifid, slightly scabrous on the 2 nerves above the middle; stamens 3, the anthers linear and nearly 2mm long; rachis thickened at the insertion of the flowers, puberulent, terminating in a rudimentary flower, each of the joints about 1.5 mm long; styles 2, with rather short and sparsely plumose stigmas, inserted separately upon the glabrous ovary; lodicules present.

This grass is certainly closely allied to the genus Poa, in distinction from which it is chiefly characterized by its linear spikelets, shorter and very unequal glumes; it also bears a strong resemblance to the genus Panicularia, from which it is at once distinguished by its obscurely nerved glumes and palets. It is unlike *P. lemmoni* (V.) Scb. in its smaller size, purplish culms and panicles, appressed and fewer flowered spikelets. Mr. Wm. C. Cusick collected it in a moist alkaline meadow at Cold Spring on the Burns-Prineville road of Crook county, Oregon, June, 1901. Type specimen (number 2621) is in my herbarium.

Sitanion albescens, n. sp.—A cespitose annual or biennial, with smooth or sparsely woolly cord-like roots. Culms many, 1–2 dm high, erect, striate and glaucous green below the spike, barely exceeding the uppermost sheath. Blades numerous, coriaceous, crowded below the middle of the stem, rigidly involute, smooth and light green on the outer surface, ridged and cinereous pubescent on the inner side, slightly scabrous along the edges, usually slender and ascending, 3–8 cm long; sheaths overlapping, striate, smooth, glaucous green, persistent and marcescent near the base, open at the throat; ligule 5 mm broad, frequently produced on the sides into callous tips. Spike 7 cm long, barely exceeding the leaves, breaking up readily at its nodes, light green when in flower but soon turning purplish-gray; internodes of

rachis 3–4 mm in length, much flattened, with or without a cinereous pubescence on its edges; spikelets usually 2 at each joint, though frequently one of them is entirely sterile, 3–4 cm long including the awns, 1–3-flowered; glumes 5–7, generally entire, 7 cm long, 1–3 striate, smooth or finely pubescent, gradually tapering into a slender scabrous awn 3 cm long which is strongly recurved in age; lower palet nerveless except toward the apex, 7–10 mm long, coriaceous, smooth or puberulent, finely scabrous on the nerves above the middle, extending into an awn 2–3 cm long; upper palet 8 mm long, the two nerves smooth or slightly scabrous toward the bidentate apex; stamens 3, anthers 2 mm long; styles 2, from the apex of the ciliate callous cap of ovary; caryopsis short, stipitate at the base, smooth, plump, with a groove on the side of the upper palet.

This species was collected in the valley north of Ellensburg, Kittitas county, Washington, by Kirk Whited, June, 1898. It is distinguished from S. glabrum Sm. by its more cespitose habit, and usually by its slender rigidly involute leaves, whose sheaths are overlapping. Type specimen (number 670) is in Mr. Whited's herbarium.

Sitanion ciliatum, n. sp.—A tufted annual or biennial from strong rigid roots usually covered with a woolly matrix. Culm 1-2cm high, striate and cinereous pubescent just below the inflorescence, strictly erect, clothed at the base with marcescent sheaths. Leaves numerous from sterile shoots, convolute to involute, averaging 7cm in length, pungently pointed, upper surface glaucous and finely scabrous on the striae, lower surface covered with a close cinereous and usually with a longer ciliate pubescence; cauline leaves flat and broader; sheaths at least equaling the internodes, open at the throat, the lower ones cinereous and ciliate pubescent, the uppermost one cinereous pubescent and loosely including the culms; ligules very narrow, on the sides often developed into callous protuberances, decurrent down the sheath margin as a hyaline membrane. Spike 7cm long, densely virgate, purplish brown at maturity, readily breaking up at the joints; 2 spikelets at each joint, one of which is frequently sterile, 3-4cm long including the awns, 1-3-flowered; rachis joints 3-4cm long, compressed, smooth or with sparse cilia along

the edges; glumes 4–6, bifid to the base, narrow, 1–3 striate, nearly smooth toward the base, scabrous on the nerves, about 10 mm long, gradually tapering into a scabrous awn 3–4 m long which is strongly recurved in age; lower palet 8 mm long, puberulent or scabrous on the 5 nerves, extending into a scabrous purplish awn 3–4 m long; upper palet equal in length, finely scabrous on the 2 nerves above the middle, bidentate; anthers of the stamens 2 mm long; styles 2, from the ciliate callous cap of the ovary; the two lodicules conspicuous; seed 6 mm long, pointed at the base, grooved on the side of the upper palet.

It is quite similar to S. albescens Elm., but may be recognized by the cinereous and ciliate pubescence of the sheaths and leaves. They may be found to intergrade, yet it seems best to recognize them as two forms. Mr. Kirk Whited collected it on dry rocky hills west of Wenatchee, Chelan county, Washington, June, 1901. Type specimen is in my herbarium.

Sitanion strictum, n. sp.—A densely tufted annual or biennial, with cord-like roots covered with a woolly matrix. Culms strict, 2-4 dm high, pubescent or nearly glabrous below the inflorescence. Leaves erect, conduplicate to involute, slender, sharply pointed, striate, villous on both sides, lower surface greenish, upper paler; sheaths equaling the internodes, striate, soft pubescent, usually overlapping, the upper ones loosely inclosing the stems, the basal ones persistent and becoming marcescent; ligule nearly obsolete. Spike light green, subflexuose, generally much exceeding the upper sheath, 7-11 cm long; spikelets 2 at each joint, 1-3-flowered, the lower flower usually fertile, 4-6cm long including the awns, readily breaking up at the joints; rachis 4 mm long, compressed, shining straw color; glumes 6-8, entire or parted from near the base and of different lengths, scabrous along the hyaline margins and on the strong ridge-like nerves, gradually extending into a slender scabrous awn 4cm long; lower palet Puberulent for the lower two-thirds, scabrously 5-nerved toward the apex, 10 mm in length, generally bearing 2 short bristle-like awns at the point of insertion of the slender scabrous awn 3-5 cm long; upper palet equal in length, scabrous on the 2 nerves toward the apex, terminating in 2 unequal bristle-like scabrous awns; stamens 3, anthers 2 mm long; the 2 styles distinct; ovary

with a ciliate callous cap; caryopsis 6^{mm} in length, plump, pointed at the base, longitudinally grooved on the side toward the upper palet.

This species has been confounded with S. villosum Sm., from which it is separated chiefly by the character of the leaves. In typical S. villosum Sm. the basal leaves are short, flat, and rigid; the cauline ones are also rigid, flat, tapering from the base to the pungently pointed apex, and they are usually divaricately disposed. This species is far more common throughout the plains of eastern Washington, while S. villosum Sm. was discovered on rocky exposed points along the Snake river. Type specimen was collected by the writer at Parker Station, Yakima county, Washington, July, 1898, and is in my herbarium.

Hypericum bryophytum, n. sp.— A loosely tufted subaquatic annual, with smooth fibrous roots. Stems densely covered with foliage, glabrous, 2-5 cm long, rather weak, procumbent and branched near the base. Leaves opposite, obtuse, ovate to oblong or obovate, entire, larger ones 5 mm long and almost as wide, sessile, ascending, attached by a broad base, usually much overlapping, glabrous or glaucous on both sides. Flowers solitary or rarely cymosely disposed, small, barely surpassing the upper pair of leaves; the 4 sepals persistent, distinct, ascending, glabrous, usually obovate, 3 mm long; petals 4, very thin, shorter than or equaling the calyx, deciduous or soon withering, deep yellow, elliptical or obovate, delicately nerved, with a fine fringe of hairs along the upper edge, otherwise smooth; stamens numerous, equaling the corolla, separate, anthers orbicular; styles 3, distinct, persistent, slightly exceeding the stamens, terminated by small capitate stigmas; capsule septicidally dehiscent, tricarpellary, many seeded; seeds light brown, cylindrical, 0.5 mm long, puberulent, longitudinally striate.

This is a strictly alpine species, which in its native place is invariably associated with mosses, to which it bears a strong resemblance. It has frequently been referred to *H. anagalloides* C. & S., which has usually a lower altitudinal range and from which it differs in its smaller size, more numerous leaves, and fewer flowers. I collected it above timber line in the Olympic mountains, Clallam county, Washington, August, 1900. Type specimen (number 2833) is in the herbarium of Stanford University.

Orthocarpus olympicus, n. sp.—An erect annual, 2-3 dm high. Stems smooth, slightly angular, usually dark brown on the

angles, fastigiately 1-5-branched from above the middle, branches sparsely pubescent. Lower leaves entire, ascending, lanceolate, deciduous, the larger ones 4 dm long, plainly 3-nerved from near the base, puberulent on both sides, the uppermost with 2 narrow lateral lobes. Spike erect, 2cm in diameter, cylindrical, not rigid, usually compact; bracts short petioled, membranous, finely hispid on the edges, elsewhere puberulent, apex of the upper ones rose-purple and nearly truncate, attenuate at base, with reticulate veins between the 3 nerves, scarcely exceeding 1 cm long and only I cm wide including the sharply acuminate lateral lobes 3-5 mm long; flower short peduncled, in the axil of the bract; calyx 7mm long, somewhat saccate, hyaline except the 4 long ciliate nerves which terminate in delicate scabrous points I mm long; corolla tubular, bilabiate, 12mm long, constricted just below the middle and bent upward, only the tips dull purple, conspicuously 12-nerved around the base; lower lip broadly obtuse, with 3 obsolete barely apiculate lobes, faintly canescent; upper lip slightly exceeding the lower, triangular, obscurely canescent, with a short blunt recurved apex; stamens 4, inserted on the corolla tube, mostly inclosed by the upper lip; anthers 2, oblong, 2-celled, the lower cell nearly equaling the upper; style equaling the stamens, the small stigma terminal; capsule puberulent, obovoid, loculicidally dehiscent; seeds not numerous, arranged on a central placenta, falcate, plump, 1.5 mm long, with narrow irregular corrugated wings.

This species was collected by the author in the Olympic mountains, Clallam county, Washington, August, 1900, at an elevation of 1000 to 1500 m. It seems to be rare, and in my opinion it is wholly unlike O. imbricatus Torr. in its smaller, less coriaceous, and broadly obtuse or truncate bracts. Type specimen (number 2574) is in the herbarium of Stanford University.

HERBARIUM OF LELAND STANFORD JUNIOR UNIVERSITY.